AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Claim 1 (withdrawn): A method of designing a multifocal ophthalmic lens with one base focus and at least one additional focus, capable of reducing aberrations of the eye for at least one of the foci after its implantation, comprising the steps of:

(i) characterizing at least one corneal surface as a mathematical model;

(ii) calculating the resulting aberrations of said corneal surface(s) by employing said mathematical model; and

(iii) modelling the multifocal ophthalmic lens such that a wavefront arriving from an optical system comprising said lens and said at least one corneal surface obtains reduced aberrations for at least one of the foci.

Claim 2 (withdrawn): A method according to claim 1, wherein the ophthalmic lens is a multifocal intraocular lens.

Claim 3 (withdrawn): A method according to claim 1, comprising determining the resulting aberrations of said corneal surface(s) in terms of a wavefront having passed said cornea.

Claim 4 (withdrawn): A method according to claim 1, wherein said corneal surface(s) is(are) characterized in terms of a conoid of rotation.

Claim 5 (withdrawn): A method according to claim 1 wherein said corneal surface(s) is(are) characterized in terms of polynomials.

Claim 6 (withdrawn): A method according to claim 5, wherein said corneal surface(s) is(are) characterized in terms of a linear combination of polynomials.

Claim 7 (withdrawn): A method according to claim 1, wherein said optical system further comprises complementary means for optical correction, such as spectacles or an ophthalmic correction lens.

Claim 8 (withdrawn): A method according to claim 1, wherein estimations of corneal refractive power and axial eye length designate the selection of the optical powers for the multifocal intraocular lens.

Claim 9 (withdrawn): A method according to claim 1, wherein the multifocal intraocular lens is modelled by selecting a suitable aspheric component for the anterior surface.

Claim 10 (withdrawn): A method according to claim 1, including characterizing the front corneal surface of an individual by means of topographical measurements and expressing the corneal aberrations as a combination of polynomials.

Claim 11 (withdrawn): A method according to claim 1, including characterizing front and rear corneal surfaces of an individual by means of topographical measurements and expressing the total corneal aberrations as a combination of polynomials.

Claim 12 (withdrawn): A method according to claim 1, including characterizing corneal surfaces of a selected population and expressing average corneal aberrations of said population as a combination of polynomials.

Claim 13 (withdrawn): A method according to claim 1, comprising the further steps of:

calculating the aberrations resulting from an optical system comprising said modelled intraocular lens and cornea; and

determining if the modelled intraocular lens has provided sufficient reduction in aberrations; and optionally re-modelling the intraocular lens until a sufficient reduction is obtained.

Claim 14 (withdrawn): A method according to claim 13, wherein said aberrations are expressed as a linear combination of polynomials.

Claim 15 (withdrawn): A method according to claim 13, wherein the re-modelling includes modifying one or several of the anterior surface shape and central radius, the posterior surface shape and central radius, lens thickness and refractive index of the lens.

Claim 16 (withdrawn): A method according to claim 14, wherein the re-modelling includes modifying the anterior surface of the lens.

Claim 17 (withdrawn): A method according to claim 14, wherein said polynomials are Seidel or Zernike polynomials.

Claim 18 (withdrawn): A method according to claim 17, comprising modelling a lens such that an optical system comprising said model of intraocular lens and cornea provides reduction of spherical terms as expressed in Seidel or Zernike polynomials in a wave front having passed through the system.

Claim 19 (withdrawn): A method according to claim 17, comprising the steps of:
expressing the corneal aberrations as a linear combination of Zernike polynomials;
determining the corneal wavefront Zernike coefficients;
modelling the multifocal intraocular lens such that an optical system comprising said model lens and cornea provides a wavefront having a sufficient reduction of Zernike coefficients in at least 1 of the foci.

Claim 20 (withdrawn): A method according to claim 19, further comprising the steps of:
calculating the Zernike coefficients of a wavefront resulting from an optical system comprising the modelled multifocal intraocular lens and cornea;
determining if said intraocular lens has provided a sufficient reduction of Zernike coefficients; and

optionally re-modelling said lens until a sufficient reduction is said coefficients are obtained.

Claim 21 (withdrawn): A method according to claim 20, comprising sufficiently reducing Zernike coefficients referring to spherical aberration.

Claim 22 (withdrawn): A method according to claim 19 comprising sufficiently reducing Zernike coefficients referring to aberrations above the fourth order.

Claim 23 (withdrawn): A method, according to claim 19 comprising sufficiently reducing the 11th Zernike coefficient of a wavefront front from an optical system comprising cornea and said modelled intraocular lens, so as to obtain an eye sufficiently free from spherical aberration.

Claim 24 (withdrawn): A method according to claim 1, wherein the reduction of aberrations is optimized for one of the foci.

Claim 25 (withdrawn): A method according to claim 24, wherein the reduction of aberrations is optimized for the base focus.

Claim 26 (withdrawn): A method according to claim 24, wherein the reduction of aberrations is optimized for one of the at least one additional focus.

Claim 27 (withdrawn): A method according to claim 1, wherein the reduction of aberrations is optimized for the base focus and the at least one additional focus, simultaneously.

Claim 28 (withdrawn): A method according to claim 1, wherein the modelling of the multifocal intraocular lens comprises modelling the lens as a multifocal lens of diffractive type.

Claim 29 (withdrawn): A method according to claim 28, wherein the diffractive pattern is formed on the anterior and/or posterior surface of the lens.

Claim 30 (withdrawn): A method according to claim 29, wherein the diffractive pattern is formed on the lens surface that is modelled to reduce aberrations of the optical system.

Claim 31 (withdrawn): A method according to claim 29, wherein the diffractive pattern is formed on one surface of the lens and the other surface of the lens is modelled to reduce aberrations of the optical system.

Claim 32 (withdrawn): A method according to claim 1, wherein the modelling of the multifocal intraocular lens comprises modelling the lens as a multifocal lens of refractive type with annular rings with different radii of curvatures.

Claim 33 (withdrawn): A method according to claim 32 wherein the annular rings are formed on the lens surface that is modelled to reduce aberrations of the optical system.

Claim 34 (withdrawn): A method according to claim 32 wherein the annular rings are formed on one surface of the lens and the other surface is modelled to reduce aberrations of the optical system.

Claim 35 (withdrawn): A method according to claim 1, wherein the modelling of the multifocal intraocular lens comprises modelling a bifocal lens.

Claim 36 (withdrawn): A method according to claim 1, wherein the modeling of the multifocal intraocular lens provides a lens with substantially the same reduced aberrations for all foci.

Claim 37 (withdrawn): A method according to claim 1, wherein the sum of the modulation for the two or more foci is more than 0.40, at a spatial frequency of 50 cycles per millimetre, when the measurements are performed in an average/individual eye model using a 5mm aperture.

Claim 38 (withdrawn): A method according to claim 37, wherein the sum of the modulation for the two or more foci is more than 0.50.

Claim 39 (withdrawn): A method according to claim 37, wherein the modelling of the multifocal intraocular lens comprises modelling a bifocal lens with a light distribution of 50-50% between the two foci, and the modulation is at least 0.2 for each focus.

Claim 40 (withdrawn): A method of selecting a multifocal intraocular lens that is capable of reducing aberrations of the eye for at least one of the foci after its implantation comprising the steps of:

(i) characterizing at least one corneal surface as a mathematical model;

(ii) calculating the resulting aberrations of said corneal surfaces(s) by employing said mathematical model;

(iii) selecting an intraocular lens having a suitable configuration of optical powers from a plurality of lenses having the same power configurations, but different aberrations; and

(iv) determining if an optical system comprising said selected lens and corneal model sufficiently reduces the aberrations.

Claim 41 (withdrawn): A method according to claim 40, comprising determining the resulting aberrations of said corneal surface(s) in a wavefront having passed said cornea.

Claim 42 (withdrawn): A method according to claim 40 further comprising the steps of:

(v) calculating the aberrations of a wave front arriving from an optical system of said selected lens and corneal model;

(vi) determining if said selected multifocal intraocular lens has provided a sufficient reduction in aberrations in a wavefront arriving from said optical system for at least one of the foci; and optionally repeating steps (iii) and (iv) by selecting at least one new lens having the same optical power until finding a lens capable of sufficiently reducing the aberrations.

Claim 43 (withdrawn): A method according to claim 40, wherein said corneal surface(s) is(are) characterized in terms of a conoid of rotation.

Claim 44 (withdrawn): A method according to claim 40, wherein said corneal surface(s) is(are) characterized in terms of polynomials.

Claim 45 (withdrawn): A method according to claim 40, wherein said corneal surface(s) is(are) characterized in terms of a linear combination of polynomials.

Claim 46 (withdrawn): A method according to claim 40, wherein said optical system further comprises complementary means for optical correction, such as spectacles or an ophthalmic correction lens.

Claim 47 (withdrawn): A method according to claim 40, wherein corneal refractive power and axial eye length estimations designate the selection of lens optical powers for the multifocal intraocular lens.

Claim 48 (withdrawn): A method according to claim 39, wherein an optical system comprising said corneal model and selected multifocal intraocular lens provides for a wavefront substantially reduced from aberrations for at least one of the foci, as expressed by at least one of said polynomials.

Claim 49 (withdrawn): A method according to claim 40, including characterizing the front corneal surface of an individual by means of topographical measurements and expressing the corneal aberrations as a combination of polynomials.

Claim 50 (withdrawn): A method according to claim 40 including characterizing front and rear corneal surfaces of an individual by means of topographical measurements and expressing the total corneal aberrations as a combination of polynomials.

Claim 51 (withdrawn): A method according to claim 40, including characterizing corneal surfaces of a selected population and expressing average corneal aberrations of said population as a combination of polynomials.

Claim 52 (withdrawn): A method according to claim 45, wherein said polynomials are Seidel or Zernike polynomials.

Claim 53 (withdrawn): A method according to claim 52, comprising the steps of:
(i) expressing the corneal aberrations as a linear combination of Zernike polynomials;
(ii) determining the corneal Zernike coefficients;
(iii) selecting the multifocal intraocular lens such that an optical system comprising said lens and cornea provides a wavefront having a sufficient reduction in Zernike coefficients for at least one of the foci.

Claim 54 (withdrawn): A method according to claim 53, further comprising the steps of:
(iv) calculating the Zernike coefficients resulting from an optical system comprising the modelled multifocal intraocular lens and cornea;
(v) determining if said intraocular lens has provided a reduction of Zernike coefficients; and optionally selecting a new lens until a sufficient reduction is said coefficients is obtained.

Claim 55 (withdrawn): A method according to claim 53, comprising determining Zernike polynomials up to the 4th order.

Claim 56 (withdrawn): A method according to claim 53 comprising sufficiently reducing Zernike coefficients referring to spherical aberration.

Claim 57 (withdrawn): A method according to claim 53 comprising sufficiently reducing Zernike coefficients above the fourth order.

Claim 58 (withdrawn): A method according to claim 53 comprising sufficiently reducing the 11th Zernike coefficient of a wavefront front from an optical system comprising model cornea and said selected intraocular lens, so as to obtain an eye sufficiently free from spherical aberration for at least one of the foci.

Claim 59 (withdrawn): A method according to claim 53 comprising selecting a intraocular lens such that an optical system comprising said intraocular lens and cornea provides reduction of spherical aberration terms as expressed in Seidel or Zernike polynomials in a wave front having passed through the system.

Claim 60 (withdrawn): A method according to claim 53, wherein reduction in higher aberration terms is accomplished.

Claim 61 (withdrawn): A method according to claim 40, characterized by selecting a multifocal intraocular lens from a kit comprising lenses with a suitable range of power configurations and within each range of power configurations a plurality of lenses having different aberrations.

Claim 62 (withdrawn): A method according to claim 61, wherein said aberrations are spherical aberrations.

Claim 63 (withdrawn): A method according to claim 62, wherein said lenses within each range of power configurations have surfaces with different aspheric components.

Claim 64 (withdrawn): A method according to claim 63, wherein said surfaces are the anterior surfaces.

Claim 65 (withdrawn): A method according to claim 40, wherein the reduction of aberrations is optimized for one of the foci.

Claim 66 (withdrawn): A method according to claim 65, wherein the reduction of aberrations is optimized for the base focus.

Claim 67 (withdrawn): A method according to claim 65, wherein the reduction of aberrations is optimized for one of the at least one additional focus.

Claim 68 (withdrawn): A method according to claim 40, wherein the reduction of aberrations is optimized for the base focus and the at least one additional focus, simultaneously.

Claim 69 (withdrawn): A method according to claim 40, wherein the multifocal intraocular lens is a multifocal lens of diffractive type.

Claim 70 (withdrawn): A method according to claim 69, wherein the diffractive pattern is formed on the anterior and/or posterior surface of the lens.

Claim 71 (withdrawn): A method according to claim 70, wherein the diffractive pattern is formed on the lens surface that is modelled to reduce aberrations of the optical system.

Claim 72 (withdrawn): A method according to claim 70, wherein the diffractive pattern is formed on one surface of the lens and the other surface of the lens is modelled to reduce aberrations of the optical system.

Claim 73 (withdrawn): A method according to claim 40, wherein the multifocal intraocular lens is a multifocal lens of refractive type with annular rings with different radii of curvatures.

Claim 74 (withdrawn): A method according to claim 73 wherein the annular rings are formed on the lens surface that is modelled to reduce aberrations of the optical system.

Claim 75 (withdrawn): A method according to claim 73 wherein the annular rings are formed on one surface of the lens and the other surface is modelled to reduce aberrations of the optical system.

Claim 76 (withdrawn): A method according to claim 40, wherein the multifocal intraocular lens is a bifocal lens.

Claim 77 (withdrawn): A method according to claim 40, wherein the multifocal intraocular lens has substantially the same reduced aberrations for all foci.

Claim 78 (withdrawn): A method according to claim 40, wherein the sum of the modulation for the two or more foci is more than 0.40, at a spatial frequency of 50 cycles per millimetre, when the measurements are performed in an average/individual eye model using a 5mm aperture.

Claim 79 (withdrawn): A method according to claim 78, wherein the sum of the modulation for the two or more foci is more than 0.50.

Claim 80 (withdrawn): A method according to claim 78, wherein the lens is bifocal with a light distribution of 50-50% between the two foci and the modulation is at least 0.2 for each focus.

Claim 81 (withdrawn): A method of designing a multifocal ophthalmic lens suitable for implantation into the eye, comprising the steps of:

selecting a representative group of patients;

collecting corneal topographic data for each subject in the group;

transferring said data to terms representing the corneal surface shape of each subject for a preset aperture size;

calculating a mean value of at least one corneal surface shape term of said group, so as to obtain at least one mean corneal surface shape term and/or calculating a mean value of at least one to the cornea corresponding corneal wavefront aberration term, each corneal wavefront aberration term being obtained by transforming corresponding through corneal surfac;e shape terms; and

from said at least one mean corneal surface shape term or from said at least one mean corneal wavefront aberration term designing a multifocal ophthalmic lens capable of reducing said at least one mean wavefront aberration term of the optical system comprising cornea and lens for at least one of the foci.

Claim 82 (withdrawn): Method according to claim 81, further comprising the steps of:

designing an average corneal model for the group of people from the calculated at least one mean corneal surface shape term or from the at least one mean corneal wavefront aberration term; and

checking that the designed multifocal ophthalmic lens compensates correctly for the at least one mean aberration term for at least one of the foci by measuring these specific aberration terms of a wavefront having travelled through the model average cornea and the lens and redesigning the multifocallens if said at least one aberration term not has been sufficiently reduced in the measured wavefront.

Claim 83 (withdrawn): Method according to claim 81, comprising calculating an aspheric surface descriptive constant for the lens to be designed from the mean corneal surface shape terms or from the mean corneal wavefront aberration terms for a predetermined radius.

Claim 84 (withdrawn): Method according to claim 81, comprising selecting people in a specific age interval to constitute the group of people.

Claim 85 (withdrawn): Method according to claim 81, comprising selecting people who will undergo a cataract surgery to constitute the group of people.

Claim 86 (withdrawn): Method according to claim 81, comprising designing the lens specifically for a patient that has undergone corneal surgery and therefore selecting people who have undergone corneal surgery to constitute the group of people.

Claim 87 (withdrawn): Method according to claim 81, comprising selecting people who have a specific ocular disease to constitute the group of people.

Claim 88 (withdrawn): Method according to claim 81, comprising selecting people who have a specific ocular optical defect to constitute the group of people.

Claim 89 (withdrawn): Method according to claim 81, further comprising the steps of:

measuring the at least one wavefront aberration term of one specific patient's cornea; and

determining if the selected group corresponding to this patient is representative for this specific patient and, if this is the case, implanting the multifocal lens designed from these average values and, if this is not the case, implanting a multifocal lens designed from average values from another group or designing an individual lens for this patient.

Claim 90 (withdrawn): Method according to claim 89, comprising providing the multifocal lens with at least one nonspherical surface that reduces at least one positive aberration term of an incoming nonspherical wavefront for at least one of the foci.

Claim 91 (withdrawn): Method according to claim 90, wherein said positive aberration term is a positive spherical aberration term.

Claim 92 (withdrawn): Method according to claim 81, comprising providing the multifocal lens with at least one nonspherical surface that reduces at least one term of a Zernike polynomial representing the aberration of an incoming nonspherical wavefront for at least one of the foci.

Claim 93 (withdrawn): Method according to claim 92, comprising providing the lens with at least one nonspherical surface that reduces the 11th normalized Zernike term representing the spherical aberration of an incoming nonspherical wavefront.

Claim 94 (withdrawn): A method according to claim 81, comprising designing a multifocal lens to reduce, for at least one of the foci, spherical aberration in a wavefront arriving from an average corneal surface having the formula:

$$z=\frac{(1/R)r^2}{1+\sqrt{1-(\frac{1}{R})^2(\mathbf{cc}+1)r^2}}+\mathbf{ad}r^4+\mathbf{ae}r^6$$

wherein the conical constant cc has a value ranging between -1 and 0, R is the central corneal radius and ad and ae are aspheric constants.

Claim 95 (withdrawn): A method according to claim 94, wherein the conical constant (cc) ranges from about -0.05 for an aperture size (pupillary diameter) of 4 mm to about -0.18 for an aperture size of 7 mm.

Claim 96 (withdrawn): Method according to claim 81, comprising providing the multifocal lens with a surface described by a conoid of rotation modified conoid having a conical constant (cc) less than 0.

Claim 97 (withdrawn): Method according to claim 81, comprising providing the multifocal lens with a, for the patient, suitable power configuration.

Claim 98 (withdrawn): Method according to claim 81, comprising designing the multifocal lens to balance, for at least one of the foci, the spherical aberration of a cornea that has a Zernike polynomial coefficient representing spherical aberration of the wavefront aberration with a value in the interval from 0.0000698 mm to 0.000871 mm for a 3 mm aperture radius.

Claim 99 (withdrawn): Method according to claim 81, comprising designing the multifocal lens to balance, for at least one of the foci, the spherical aberration of a cornea that has a Zernike polynomial coefficient representing spherical aberration of the wavefront aberration with a value in the interval from 0.0000161 mm to 0.000200 mm for a 2 mm aperture radius.

Claim 100 (withdrawn): Method according to claim 81, comprising designing the multifocal lens to balance, for at least one of the foci, the spherical aberration of a cornea that has a Zernike polynomial coefficient representing spherical aberration of the wavefront aberration with a value in the interval from 0.0000465 mm to 0.000419 mm for a 2.5 mm aperture radius.

Claim 101 (withdrawn): Method according to claim 81, comprising designing the multifocal lens to balance, for at least one of the foci, the spherical aberration of a cornea that has a Zernike polynomial coefficient representing spherical aberration of the wavefront aberration with a value in the interval from 0.0000868 mm to 0.00163 mm for a 3.5 mm aperture radius.

Claim 102 (cancelled)

Claim 103 (currently amended): A diffractive multifocal ophthalmic lens ~~with one base focus and at least one additional focus~~, comprising:
a first refractive surface; and
a second refractive surface containing a diffractive pattern;
wherein the first refractive surface and the second refractive surface form a base focus;
wherein the first refractive surface, the second refractive surface and the diffractive pattern form an additional focus;
wherein ~~the shape of the lens is modelled such that~~ the first refractive surface and the second refractive surface determine a negative lens spherical aberration; and
~~the resulting aberrations are reduced for at least one of the foci in an optical system comprising said multifocal lens and a model cornea having aberration terms, or being without aberration terms~~
wherein the sum of the lens spherical aberration and a cornea spherical aberration is closer to zero than the cornea spherical aberration alone, for at least one of the base focus and the additional focus.

Claims 104-176 (cancelled)

Claim 177 (previously presented): An multifocal ophthalmic lens, comprising:
a diffractive pattern formed on a surface of the lens and configured to compensate for a chromatic aberration introduced by at least one of a refractive part of the lens and an optical surface of an eye, the diffractive pattern configured, in combination with at least the refractive part, to produce a first focus and a second focus; and
an aspheric surface configured to reduce a monochromatic aberration of at least one of the foci, the monochromatic aberration being introduced by at least one of the diffractive pattern and the optical surface of the eye.

Claim 178 (previously presented): The multifocal ophthalmic lens of claim 177, wherein the monochromatic aberration is a spherical aberration.

Claim 179 (previously presented): The multifocal ophthalmic lens of claim 177, wherein the diffractive pattern comprises an apodization zone configured to gradually shift energy from the first focus to the second focus.

Claim 180 (previously presented): The multifocal ophthalmic lens of claim 177, wherein the diffractive pattern comprises echelettes having a depth is reduced towards the lens periphery.

Claim 181 (previously presented): The multifocal ophthalmic lens of claim 177, wherein the aspheric surface is configured to reduce a Zernike coefficients of the monochromatic aberration

Claim 182 (previously presented): The multifocal ophthalmic lens of claim 181, wherein the Zernike coefficient is a Z_{11} term.

Claim 183 (previously presented): The multifocal ophthalmic lens of claim 177, further comprising a second diffraction pattern disposed on a surface opposite the multifocal diffractive pattern.

Claim 184 (previously presented): The multifocal ophthalmic lens of claim 177, wherein the aspheric surface is disposed on the multi focal diffractive pattern.

Claim 185 (previously presented): The multifocal ophthalmic lens of claim 177, wherein the aspheric surface is disposed on a surface opposite the multifocal diffractive pattern.

Claim 186 (previously presented): The multifocal ophthalmic lens of claim 177, wherein the optical surface of the eye is a corneal surface.

Claim 187 (previously presented): An multifocal ophthalmic lens, comprising:

a diffractive pattern formed on a surface of the lens and configured to compensate for a chromatic aberration introduced by at least one of a refractive part of the lens and an optical surface of an eye, the diffractive pattern configured, in combination with at least the refractive part, to produce a first focus and a second focus; and

an aspheric surface configured to increase the modulation for the Modulation Transfer Function of the lens.

Claim 188 (previously presented): The multifocal ophthalmic lens of claim 186, wherein the modulation of the lens is at least 0.2 for the two foci at a spatial frequency of 50 cycles/mm and at an aperture for the eye of 5 mm.

Claim 189 (previously presented): The multifocal ophthalmic lens of claim 188, wherein lens is configured to provide a light distribution between the two foci that is 50:50%.

Claim 190 (previously presented): The multifocal ophthalmic lens of claim 188, wherein the modulation for the two foci is greater than 0.40.

Claim 191 (previously presented): The multifocal ophthalmic lens of claim 186, wherein the aspheric surface configured to increase the modulation for the Modulation Transfer Function of the lens compared to a conventional lens without the aspheric surface.

Claim 192 (new): A multifocal ophthalmic lens, comprising:

an anterior surface having an anterior radius;

a posterior surface having a posterior radius and separated axially from the anterior surface by a lens thickness;

a lens material disposed between the anterior and posterior surfaces and having a refractive index;

a lens far power determined in part by the anterior radius, the posterior radius, the lens thickness and the refractive index, the lens far power being sufficient to form an image on a retina of a relatively distant object;

a diffractive portion disposed on at least one of the anterior and posterior surfaces, and having a diffractive power and a diffractive feature depth;

a lens near power determined in part by the sum of the lens far power and the diffractive power, the lens near power being sufficient to form an image on the retina of a relatively close object;

a lens near diffraction efficiency determined in part by the diffractive feature depth;

an aspheric portion disposed on at least one of the anterior and posterior surfaces; and

a lens spherical aberration determined by the anterior radius, the posterior radius, the lens thickness, the refractive index and the aspheric portion;

wherein the sum of the lens spherical aberration and a cornea spherical aberration is closer to zero than the cornea spherical aberration alone.

Claim 193 (new): The multifocal ophthalmic lens of claim 192, further comprising:

a refractive chromatic aberration determined by the anterior radius, the posterior radius, the lens thickness, the refractive index and a cornea chromatic aberration; and

a diffractive chromatic aberration determined by the diffractive portion;

wherein the sum of the refractive chromatic aberration and the diffractive chromatic aberration is closer to zero than the refractive chromatic aberration alone.

Claim 194 (new): The multifocal ophthalmic lens of claim 193, wherein the cornea chromatic aberration corresponds to an average cornea with properties that are averaged over a population.

Claim 195 (new): The multifocal ophthalmic lens of claim 193, wherein the cornea chromatic aberration corresponds to an individual cornea with properties that correspond to a single patient.

Claim 196 (new): The multifocal ophthalmic lens of claim 193, wherein the refractive index, the lens far power, the lens near power, the lens near diffraction efficiency, the lens spherical aberration, the cornea chromatic aberration, the refractive chromatic aberration, and the diffractive chromatic aberration are all expressed at a wavelength of 550 nm.

Claim 197 (new): The multifocal ophthalmic lens of claim 192, wherein the near diffraction efficiency is between about 30% and about 70%.

Claim 198 (new): The multifocal ophthalmic lens of claim 192, wherein the near diffraction efficiency is about 50%.

Claim 199 (new): The multifocal ophthalmic lens of claim 192, wherein the diffractive feature depth decreases from the center to the edge of the multifocal ophthalmic lens.

Claim 200 (new): The multifocal ophthalmic lens of claim 192, wherein the diffractive power is between about 2 diopters and about 6 diopters.

Claim 201 (new): The multifocal ophthalmic lens of claim 192, wherein the diffractive power is about 4 diopters.

Claim 202 (new): The multifocal ophthalmic lens of claim 192, wherein the lens far power is less than or equal to 34 diopters.

Claim 203 (new): The multifocal ophthalmic lens of claim 192, wherein the cornea spherical aberration corresponds to an average cornea with properties that are averaged over a population.

Claim 204 (new): The multifocal ophthalmic lens of claim 192, wherein the cornea spherical aberration corresponds to an individual cornea with properties that correspond to a single patient.

Claim 205 (new): The multifocal ophthalmic lens of claim 192, wherein the aspheric portion comprises at least one of a conic constant, a fourth order aspheric coefficient and a sixth order aspheric coefficient.

Claim 206 (new): The multifocal ophthalmic lens of claim 192, wherein the sum of the lens spherical aberration and a cornea spherical aberration is essentially zero.

Claim 207 (new): The multifocal ophthalmic lens of claim 192, wherein the aspheric portion is disposed on the anterior surface.

Claim 208 (new): The multifocal ophthalmic lens of claim 192, wherein the aspheric portion is disposed on the posterior surface.

Claim 209 (new): The multifocal ophthalmic lens of claim 192, wherein the aspheric portion is disposed on both the anterior and posterior surfaces.

Claim 210 (new): The multifocal ophthalmic lens of claim 192, wherein the diffractive portion is disposed on the anterior surface.

Claim 211 (new): The multifocal ophthalmic lens of claim 192, wherein the diffractive portion is disposed on the posterior surface.

Claim 212 (new): A diffractive multifocal ophthalmic lens, comprising:
an anterior side;
a posterior side opposing the anterior side;
a lens shape comprising the anterior side and the posterior side;
a refractive base curve on at least one of the anterior side and the posterior side; and

a diffractive pattern on at least one of the anterior side and the posterior side;

wherein the diffractive pattern and the refractive base curve together form a far focus and a near focus;

wherein the lens shape includes an aspheric surface;

wherein the lens shape produces a lens spherical aberration;

wherein the sum of the lens spherical aberration and a positive cornea spherical aberration is closer to zero than the cornea spherical aberration alone, for at least one of the far focus and the near focus.

Claim 213 (new): The diffractive multifocal ophthalmic lens of claim 212, wherein the refractive base curve and the diffractive pattern are on the same side of the lens.

Claim 214 (new): The diffractive multifocal ophthalmic lens of claim 212, wherein the refractive base curve and the diffractive pattern are on opposite sides of the lens.

Claim 215 (new): The diffractive multifocal ophthalmic lens of claim 212, wherein the refractive base curve includes the aspheric surface.